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# USATHAMA

U.S. Army Toxic and Hazardous Materials Agency

## Enhanced Preliminary Assessment Report:

Elizabeth Army Housing Units  
Elizabeth, Pennsylvania



October 1989

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prepared for

Commander  
U.S. Army Toxic and Hazardous Materials Agency  
Aberdeen Proving Ground, Maryland 21010-5401

prepared by

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<p>Argonne National Laboratory has conducted an enhanced preliminary assessment of the Army housing property located in Elizabeth, PA. The objectives of this assessment include identifying and characterizing all environmentally significant operations, identifying areas of environmental contamination that may require immediate remedial actions, identifying other actions which may be necessary to resolve all identified environmental problems, and identifying other environmental concerns that may present impediments to the expeditious sale of this property.</p>			
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## SUMMARY

The Elizabeth housing area does not present an imminent or substantial threat to human health or the environment. There is no evidence to suggest that hazardous or toxic constituents have ever been released from this property. There are no known environmental impacts from this property and during the site investigation, none were identified.

Although the 12 housing units in the area were originally constructed to support a Nike missile battery, all available documentation and circumstantial evidence suggest that the housing property was independent of the battery's operational activities. No related wastes were delivered to this property for management of disposal. This property was independent of the Nike missile operations with respect to water and electrical utilities. However, the site was originally connected to the integrated fire control (IFC) area of the Elizabeth Nike battery by a sanitary sewer.

There are no known asbestos-containing construction materials used in the units other than asphalt floor tiles. The floor tiles are all in good condition. No other possible asbestos-containing materials were observed to be present at the time of inspections.

Polychlorinated biphenyls (PCBs) may be present in the three pole-mounted transformers that service the housing site. The transformers are the property of the electric utility company. However, no evidence of spills or leaks from these transformers was observed.

Based on the review of both historical and current practices at the property, the Elizabeth housing area property poses no threat to human health or the environment.

The following action is recommended prior to release of this property:

- Locate and inspect the abandoned sewer line to guarantee that it has been properly sealed; sample backfill soils in the area of the sewer line to verify that no Nike missile related wastes have migrated to the housing property along the sewer line.

This recommendation assumes that this property will most likely continue to be used for residential housing.





## 1 INTRODUCTION

In October 1988, Congress passed the Defense Authorization Amendments and Base Closure and Realignment Act, Public Law 100-526. This legislation provided the framework for making decisions about military base closures and realignments. The overall objective of the legislation is to close and realign bases so as to maximize savings without impairing the Army's overall military mission. In December 1988, the Defense Secretary's ad hoc Commission on Base Realignment and Closure issued its final report nominating candidate installations. The Commission's recommendations, subsequently approved by Congress, affect 111 Army installations, of which 81 are to be closed. Among the affected installations are 53 military housing areas, including the Elizabeth housing area addressed in this preliminary assessment.<sup>1</sup>

Legislative directives require that all base closures and realignments be performed in accordance with applicable provisions of the National Environmental Policy Act (NEPA). As a result, NEPA documentation is being prepared for all properties scheduled to be closed or realigned. The newly formed Base Closure Division of the U.S. Army Toxic and Hazardous Materials Agency is responsible for supervising the preliminary assessment effort for all affected properties. These USATHAMA assessments will subsequently be incorporated into the NEPA documentation being prepared for the properties.

This document is a report of the enhanced preliminary assessment (PA) conducted by Argonne National Laboratory (ANL) at the Army stand-alone housing area in Elizabeth, Pa.

### 1.1 AUTHORITY FOR THE PA

The USATHAMA has engaged ANL to support the Base Closure Program and assess the environmental quality of the installations proposed for closure or realignment. Preliminary assessments are being conducted under the authority of the Defense Department's Installation Restoration Program (IRP); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 91-510, also known as Superfund; the Superfund Amendments and Reauthorization Act of 1986, Public Law 99-499; and the Defense Authorization Amendments and Base Closure and Realignment Act of 1988, Public Law 100-526.

In conducting preliminary assessments, ANL has followed the methodologies and procedures outlined in Phase I of the IRP. Consequently, this PA addresses all documented or suspected incidents of actual or potential release of hazardous or toxic constituents to the environment.

In addition, this PA is "enhanced" to cover topics not normally addressed in a Phase I preliminary assessment. Specifically, this assessment considers and evaluates the following topical areas and issues:

- Status with respect to regulatory compliance,
- Asbestos,
- Polychlorinated biphenyls (PCBs),
- Radon hazards (to be assessed and reported on independently),
- Underground storage tanks,
- Current or potential restraints on facility utilization,
- Environmental issues requiring resolution,
- Health-risk perspectives associated with continued residential land use, and
- Other environmental concerns that might present impediments to the expeditious "excessing," or transfer and/or release, of federally owned property.

## 1.2 OBJECTIVES

This enhanced PA is based on existing information from Army housing records of initial property acquisition, initial construction, and major renovations and remodeling performed by local contractors or by the Army Corps of Engineers. The PA effort does not include the generation of new data. The objectives of the PA include:

- Identifying and characterizing all environmentally significant operations (ESOs),
- Identifying property areas or ESOs that may require a site investigation,
- Identifying ESOs or areas of environmental contamination that may require immediate remedial action,
- Identifying other actions that may be necessary to address and resolve all identified environmental problems, and
- Identifying other environmental concerns that may present impediments to the expeditious transfer of this property.

### 1.3 PROCEDURES

The PA began with a review of Army Housing records located at the Charles E. Kelly Support Facility, DEH Office Building No. S-630052, Pittsburgh, Pa., during the week of July 17, 1989. A site visit to the Elizabeth housing area was conducted on July 18, to obtain additional information through direct observation and interviews with personnel familiar with the property and its operations and history. Photographs were taken of the housing units and surrounding properties as a means of documenting the condition of the housing units and immediate land uses. Site photographs are appended.

All available information was evaluated with respect to actual or potential releases to air, soil, and surface and ground waters.

Attempts to gain access to the housing units through involvement of the senior occupant were unsuccessful. Therefore, the interiors of the units could not be inspected during the site visit. However, ANL investigators revisited the property on September 12, 1989, at which time the interiors of all the units were inspected.

## 2 PROPERTY CHARACTERIZATION

### 2.1 GENERAL PROPERTY INFORMATION

The Elizabeth housing area is located in Allegheny County, northeast of Elizabeth, Pa., and approximately 10 miles south-southeast of Pittsburgh.

The housing units were constructed in 1957. No additional major construction has taken place on the property since that time. The Charles E. Kelly Support Facility, Directorate of Engineering and Housing (DEH), located in Oakdale, Pa., is responsible for any major renovations, maintenance, or upgrading at the facility.

Figures 1 and 2 show the general location of the facility.

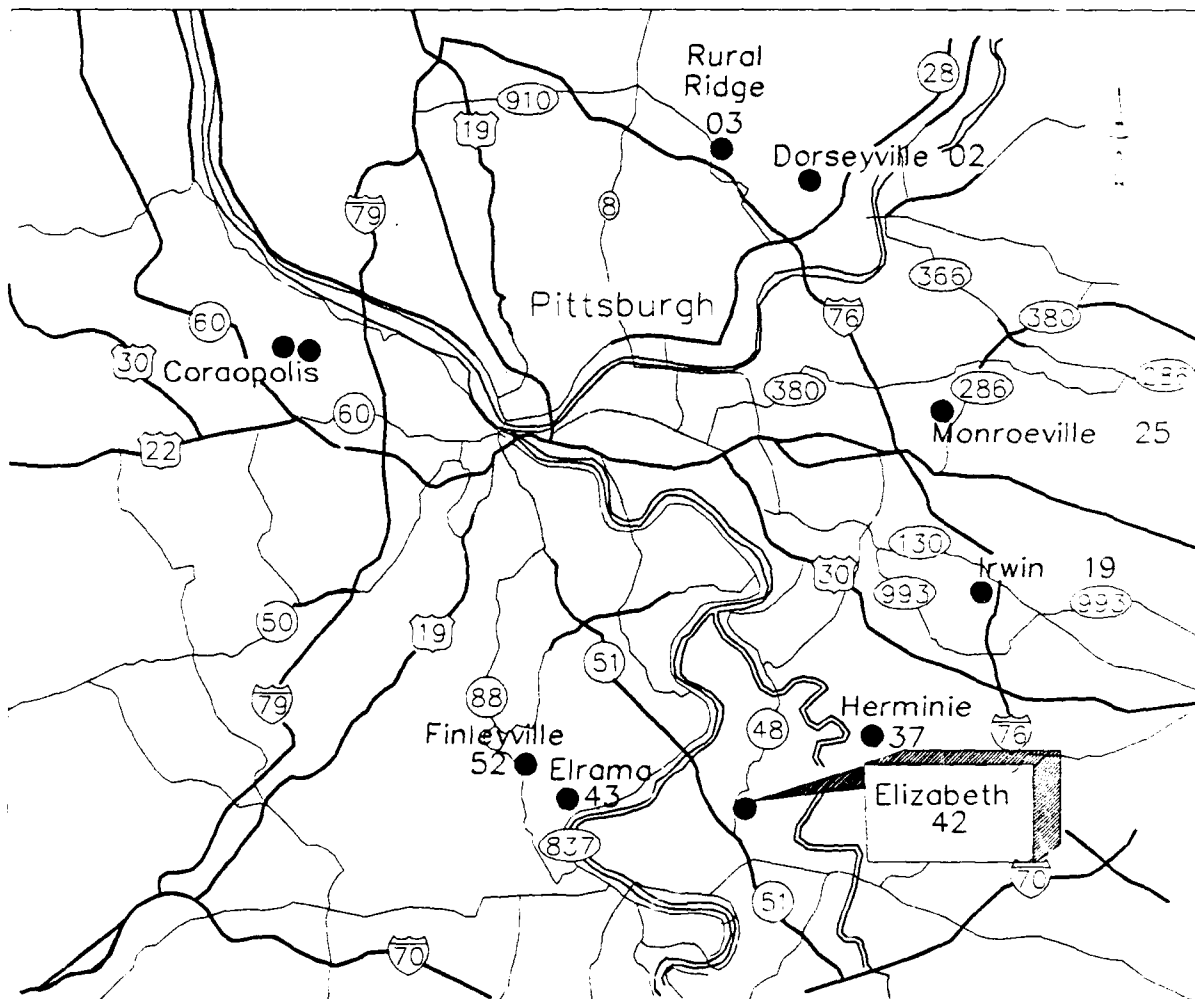
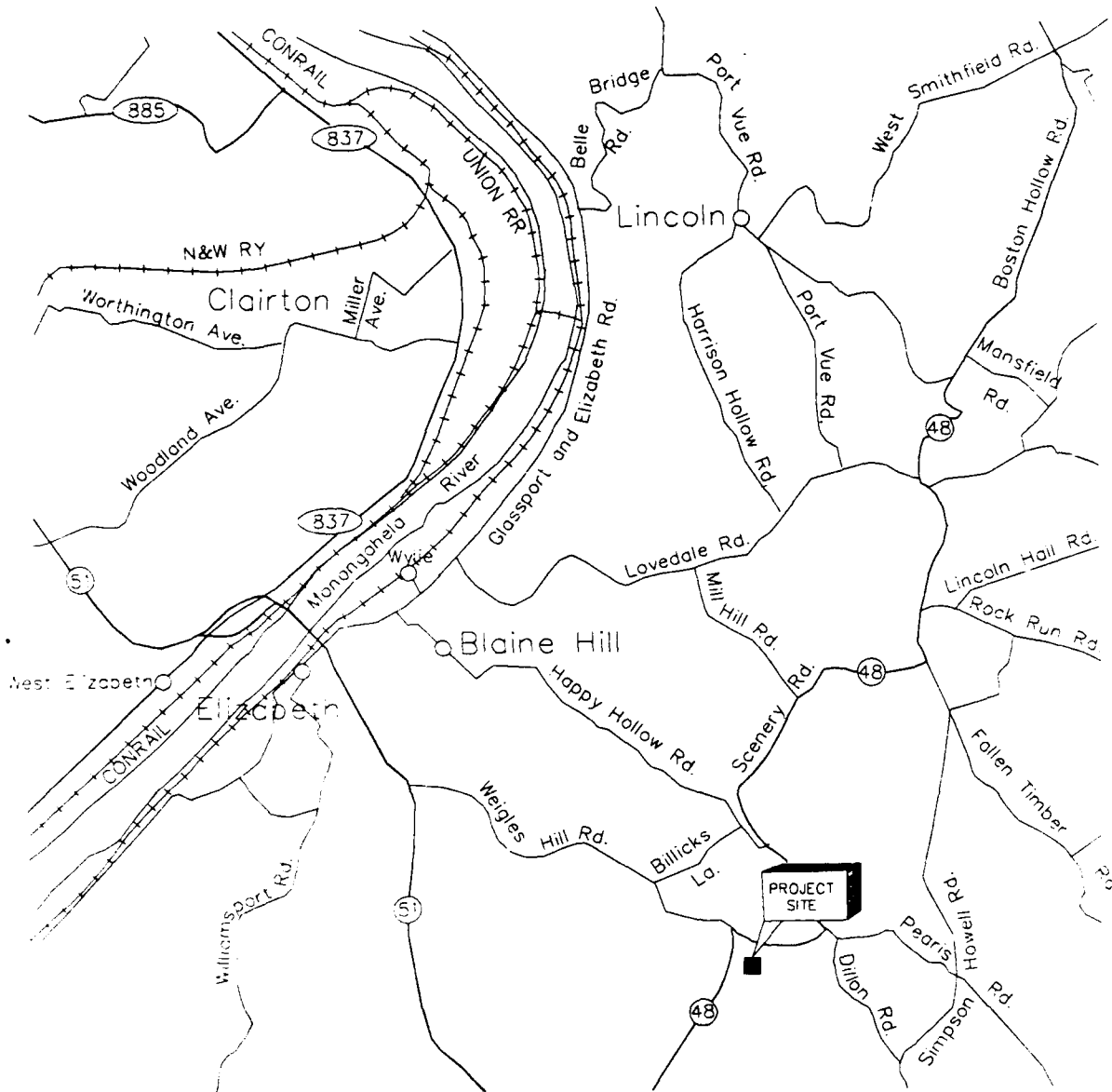


FIGURE 1 Location Map of Pennsylvania Army Housing Facilities



**FIGURE 2 Vicinity Map of Elizabeth Army Housing Units**

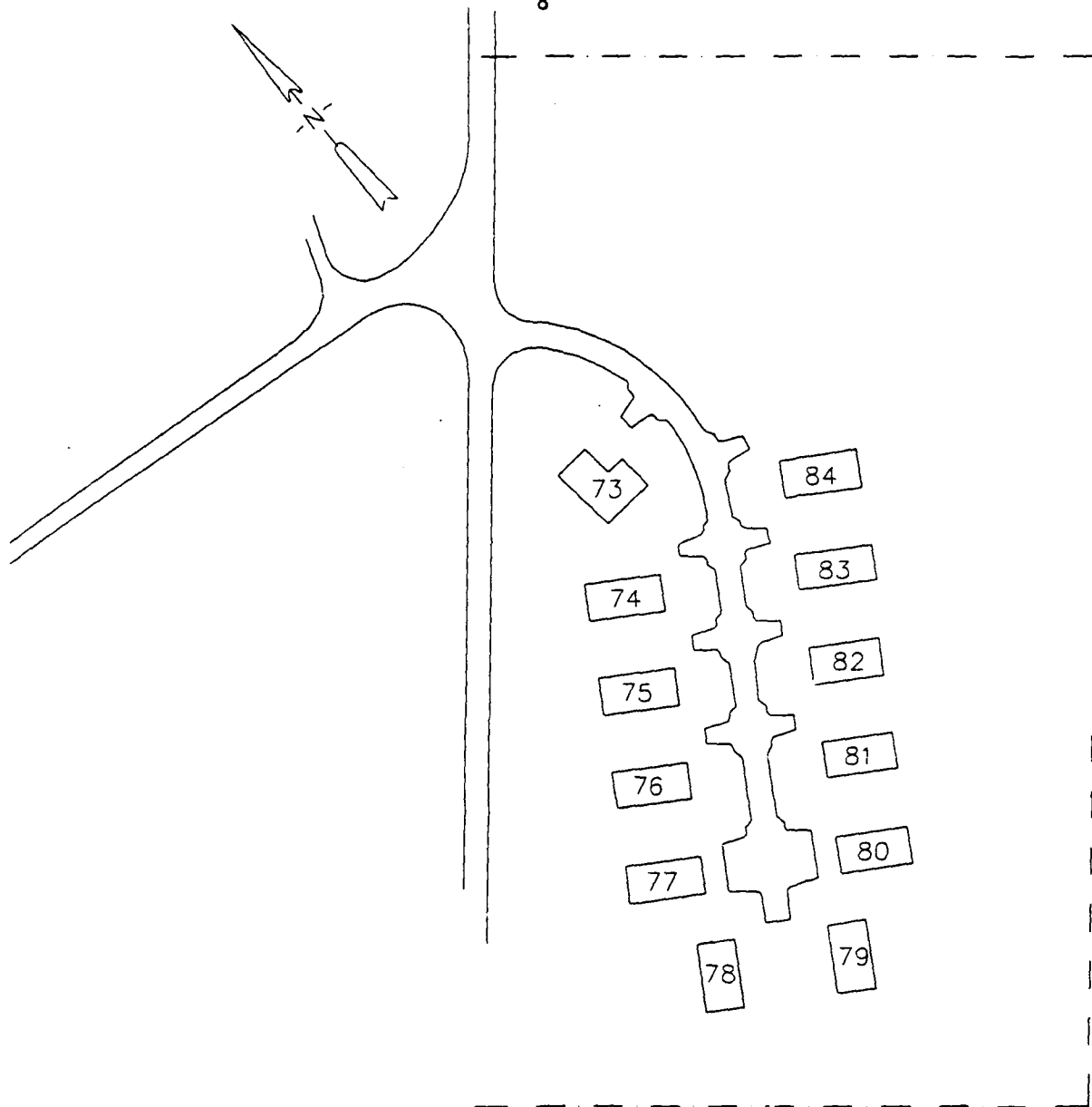
## **2.2 DESCRIPTION OF FACILITY**

Figure 3 presents the site plan of the housing property.

### **Housing Units**

The housing site is a 5.69-acre parcel of land known as the Elizabeth Army housing area and consists of 12 units that are occupied by military personnel.<sup>2</sup>

The units were constructed by the U.S. Army in 1957. The housing units have utilized city water since original construction. Sanitary sewage treatment is now



**FIGURE 3 Site Plan Map of Elizabeth Army Housing Units**

performed by the City of Elizabeth. All units are built on concrete and masonry block foundations with asphalt floor tile overlaying the foundation. Original outside construction was of wood frame covered with vertical wood siding that was later covered with vinyl siding (date unknown). The roofing is of the built-up gravel type of construction (tar and pea gravel). Each unit has an exterior storage building, two garbage receptacles (no longer in use), and terrace paving.<sup>3</sup>

The housing area is made up of one officer's three-bedroom home, having 1,307 square feet; and two officers' two-bedroom homes having 1,131 square feet each. The enlisted men's housing units are made up of three two-bedroom homes each having 1,013 square feet; and six three-bedroom homes having 1,117 square feet each.<sup>4</sup>

All units have separate natural gas forced-air heating facilities that are adequate for the climatic conditions for the area. A play area is located inside the housing site's property boundary and is used by the children who live in the Elizabeth housing units. This playground is approximately 5,940 square feet and is equipped with playground equipment such as slides, merry-go-rounds, jungle gyms and swings. A bus-passenger waiting shelter is located on the property.

### **Utilities**

Electricity for the Elizabeth housing area is furnished by the West Pennsylvania Power Company, which also owns the three pole-mounted electrical transformers located on the property. Water is furnished by the Western Pennsylvania Water Company, Pittsburgh Suburban District. Natural gas is furnished by Equitable Gas Company,<sup>5</sup> and refuse (solid waste) is collected by Edmond's Trucking Company, a private contractor.<sup>6</sup>

### **Sewage**

The Peter's Creek Sanitary Authority furnishes sanitary sewage treatment for the housing area. Sewage from the housing units originally was delivered by sewer for treatment at the Army-owned treatment facility located on the nearby Nike fire control area. However, in 1969, the housing units were connected to the municipal treatment facility for the town of Elizabeth. No documentation is available on the abandonment of the original sewer line. The sewer line is presumed to have been abandoned in place.

### **Storm Drainage System**

The storm drainage for the housing units consists of outfalls to open-ground ditches and surface runoff.

### **Other Permanent Structures or Property Improvements**

There are no other permanent structures or major property improvements on this property.

## **2.3 PROPERTY HISTORY**

### **2.3.1 Nike Defense Program and Typical Battery-Level Practices**

Generic information on the national Nike antiaircraft defense program has been compiled in two studies, one commissioned by the Army Corps of Engineers<sup>7</sup> and the other by the U.S. Army Toxic and Hazardous Materials Agency.<sup>8</sup> In both studies, independent contractors relied on information contained in unclassified documents related to the Nike surface-to-air missile program, including engineering drawings and

specifications (for the facilities and the missiles themselves), interviews with Army personnel participating in the Nike program, and operations manuals and directives relating to the operations and maintenance of Nike facilities. Taken together, these two reports represent the most complete assemblage of generic information on the Nike missile program from an environmental perspective. Salient points from both reports are condensed below.

At its zenith in the early 1960s, the Nike program included 291 batteries located throughout the continental United States. The program was completely phased out by 1976, with many of the properties sold to private concerns or exceded to state or local governments for nominal fees.

Nike Ajax missiles were first deployed in 1954 at installations throughout the continental United States, replacing, or in some cases augmenting, conventional artillery batteries and providing protection from aerial attack for strategic resources and population centers. Typically, Nike batteries were located in rural areas encircling the protected area. The Ajax was a two-stage missile using a solid-fuel booster rocket and a liquid-fuel sustainer motor to deliver a warhead to airborne targets.

The Ajax missile was gradually replaced by the Nike Hercules missile, introduced in 1958. Like the Ajax, the Hercules was a two-stage missile, but it differed from the Ajax in that its second stage was a solid-fuel rather than liquid-fuel power source and its payload often was a nuclear rather than conventional warhead. Ajax-to-Hercules conversions occurred between 1958 and 1961 and required little change in existing Nike battery facilities. A third-generation missile, the Zeus, was phased out during development and consequently was never deployed.

A typical Nike missile battery consisted of two distinct and separate operating units, the launch operations and the integrated fire control (IFC) operations. The two operating areas were separated by distances of less than two miles, with lines of sight between them for communications purposes. A third separate area was also sometimes part of the battery. This area was typically equidistant from the two battery operating sites and contained housing for married personnel assigned to the battery. Occasionally, these housing areas also contained battalion headquarters, which were responsible for a number of Nike batteries.

Depending on area characteristics and convenience, the housing areas were often reliant on the launch or IFC sites for utilities such as potable water, electrical power, and sewage treatment. In those instances, buried utility lines connected the housing area to one or both of the other battery properties. It is also possible, however, that housing areas were completely independent of the missile launcher and tracking operations. In those instances, the necessary utilities were either maintained on the housing site or purchased from the local community. In many localities, as the character of the land area around the housing units changed from rural to suburban or urban, communities extended utility services to the housing unit locations, in which case conversions from independent systems to community systems were made.

A large variety of wastes was associated with the operation and maintenance of Nike missile batteries. Normally encountered wastes included benzene, carbon



tetrachloride, chromium and lead (contained in paints and protective coatings), petroleum hydrocarbons, perchloroethylene, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, and trichloroethylene. Because of the rural locations of these batteries, and also because very few regulatory controls existed at that time, most of these wastes were managed "on-site." (Unused rocket propellants and explosives, however, would always have been returned to central supply depots and not disposed of on-site.) It is further conceivable that wastes generated at one of the Nike properties may have been transferred to its companion property for management or disposal.

Wastes related to missile operation and maintenance would not have been purposely transferred from a battery operating area to a housing area with no facilities for waste management or disposal. In some instances, however, the sewage treatment facilities for all Nike battery properties were located at the housing area; that possibility cannot be automatically ignored. Finally, where housing areas received various utilities from either of the operating areas, it is also possible that wastes disposed of on those other properties may have migrated to the housing area via the buried utility lines. And since decommissioning of the Nike batteries did not normally involve removal of buried utility or communication lines, any such contaminant migration is likely to have gone unnoticed.

### **2.3.2 Elizabeth Housing Units**

The Elizabeth housing area was first constructed in 1957 as a stand-alone housing facility for officers and enlisted personnel assigned to the Elizabeth Nike site. Thirteen single-family housing units were constructed on a 5.69-acre parcel of land just outside the town of Elizabeth. The site has been used as a family housing area for active-duty military personnel in the greater Pittsburgh area since the missile sites were deactivated in the early 1970s.

All the Elizabeth housing units are built on foundations made of concrete and masonry block with asphalt flooring overlaying the concrete block. Original outside construction was of wood frame covered with vertical wood siding. The siding was then later recovered with vinyl siding (date unknown). The roofing is of the built-up gravel type of construction (tar and pea gravel). Each unit was originally equipped with forced-air natural gas-fired furnaces. Natural gas for indirect heating has been supplied to this property since the time of its initial construction, therefore, no underground storage tanks ever existed on the property. Since the initial property development in 1957, the housing units have always received water from the city. The housing units have been served by the Elizabeth sanitary system since 1969. No other permanent structures have been added and none of the original structures has been razed.

## **2.4 ENVIRONMENTAL SETTING AND SURROUNDING LAND USES**

The population of the city of Elizabeth is 1,892. The population of the state of Pennsylvania is 11,864,751; that of Allegheny County is 1,450,085 (1980 census).

The housing area is approximately 3 miles southeast of Elizabeth, Pa., on terrain composed of gently rolling to steep slopes along areas of gullies and streams. Surrounding areas are wooded, hilly, and with some residential properties.

In 1980, the land-use pattern in the Allegheny River Basin was as follows: 6% urban, 15% crop land, 5% pasture land, 60% forest, and 14% other (including surface mining).<sup>9</sup> By the year 2020, it is estimated that land-use distribution will be 10% urban, 14% cropland, 2% pasture land, 65% forest, and 9% other. Thirty-seven percent of the forest land is being commercially harvested. Urban expansions are expected to occur at the expense of farm land. The area surrounding Elizabeth is only 10 miles south-southeast of Pittsburgh and it is expected that this area will absorb some of the anticipated urban expansions within the Allegheny Basin.

Land use within the immediate Elizabeth area is primarily rural, pasture, or forest. However, Elizabeth lies adjacent to the industrialized area associated with Pittsburgh. This industrialized area extends south from Pittsburgh. Additional industrial expansions around Pittsburgh, therefore, may also involve the Elizabeth vicinity.

The entire Allegheny Basin was at one time a forest. Now, only 65% of the basin is forest. Major tree species include white pine, hemlock, oak, hickory, elm, ash, red maple, beech, birch, and aspen.

The main farm crops in Allegheny County are corn, oats, wheat, sweet corn, tomatoes and apples. Most soils within the county, however, are only marginally acceptable for such crop applications and require the regular addition of fertilizer and lime for acceptable yields. Rotating land use between row crops and pasture is a common practice, both to maintain the productivity of the soil and control erosion. Other erosion control practices include terrace farming, diversion of runoff, installation of field tiles, and the use of grassed waterways for drainage.

## 2.5 GEOLOGIC AND HYDROLOGIC SETTINGS

The Elizabeth PI-42 housing area lies within the Appalachian Plateaus Physiographic Province.<sup>10</sup> Rock types are primarily sandstones and shales that contain thin beds of coal. The rocks are divided into 10 stratigraphic units. From youngest to oldest, these units are the Dunkard Group of Permian and Pennsylvanian age; the Monongahela, Conemaugh, and Allegheny groups, and the Kanawha Formation of Pennsylvanian age; the Greenbrier Limestone and Pocono Group of Mississippian age; and the Hampshire, Chemung, and Brallier Formations of Devonian age. Coal beds are numerous in the Pennsylvanian system. The Allegheny and Monongahela groups have 12 feet and 3 feet, respectively, of workable coal. The Conemaugh Group has only thin beds of coal that are generally not workable. The Pennsylvanian system accounts for approximately 75% of the rock units present in the Elizabeth geographic area.

Soils in the Monongahela River Basin are grouped into 35 associations composed of combinations of 31 major soils. Soils in the Elizabeth area are composed mainly of the Guernesey-Culleoka association and are formed in unconsolidated water-sorted alluvial materials. Soil pH values range from highly acidic to neutral. Terrain slopes range from 3 to 35%. Soil thickness on the hillsides average 4 to 5 feet.

Quaternary deposits consist of alluvium, which overlies bedrocks in most places along stream valleys. The alluvium is generally permeable and, when saturated, yields moderate to large supplies of water. Groundwater in bedrock occurs largely in secondary openings such as joint planes or solution openings. The Conemaugh Group crops out in the extreme northern part of the county and along some stream valleys, and is the source of moderate supplies of groundwater.

The Monongahela River and its tributaries cut valleys below the water table in the interstream areas. Under this condition, the aquifers discharge on the slopes of the valleys in the form of hillside springs and seeps. Conversely, during high stream flow conditions, surface streams will recharge aquifers.

Surface water flow characteristics within the Monongahela Basin are largely the result of topographic features. Average annual runoff in Subbasin 19 ranges from 14 to 28 inches and is primarily influenced by precipitation distribution; however, land use, land cover, and geologic factors also exert some influence.<sup>11</sup> Flows in most valley streams are seasonably variable. Most streams are found in the valley floors, although, under certain hydrologic conditions, groundwater will discharge to the surface by means of hillside streams and seeps.

### **3 ENVIRONMENTALLY SIGNIFICANT OPERATIONS**

#### **3.1 ASBESTOS CONSTRUCTION MATERIALS**

Asphalt floor tiles that may contain asbestos were all found to be in good condition. Inspections conducted on September 12, 1989, revealed no insulation whatsoever on the water pipes. No other insulating materials could be found.

#### **3.2 ORIGINAL SANITARY SEWER**

As originally constructed, these housing units were connected by a sanitary sewer to the nearby Nike fire control site. No details on the abandonment of that sewer line could be located. However, during the years of its operation (1957-1969), no problems had been documented.

#### **3.3 POLYCHLORINATED BIPHENYLS**

Three electrical transformers, which may contain PCB dielectric fluid, are mounted on a pole located on the property. These transformers are owned by the West Pennsylvania Power Company. No evidence of spills or ground staining was found at the base of the power pole.

#### 4 KNOWN AND SUSPECTED RELEASES

No major releases or impacts on the environment have occurred at the Elizabeth housing area. No hazardous wastes or hazardous materials are stored on site. The housing area included in this PA is not believed to have ever been involved in Nike site-related activities. The housing area has been used exclusively as a housing site for U.S. Army families since it was constructed. No industrial activities are believed to ever have occurred on site.

## 5 PRELIMINARY ASSESSMENT CONCLUSIONS

Although these housing units were originally developed in support of a Nike missile battery, no wastes associated with the operation or maintenance of the battery were ever delivered to or managed at this housing property. Furthermore, the housing facility was completely independent of the battery's launch and fire-control operations with respect to water and electrical utilities. Although the housing property was once connected by sanitary sewer to the IFC area of the Elizabeth Nike battery, no problems have been documented. However, no details of the abandonment of that sewer line could be located. The possibility that Nike missile-related contaminants may have migrated along the abandoned sewer line needs to be further investigated.

## 6 RECOMMENDATIONS

The Elizabeth housing area represents no imminent or substantial threat to human health or the environment. There is no evidence to suggest that hazardous or toxic constituents have ever been released from this property. No immediate remedial action, therefore, is warranted for the site.

The following action is recommended prior to excessing this property.

- Locate and inspect the abandoned sewer line to guarantee that it has been properly sealed; sample backfill soils in the area of the sewer line to verify that no Nike missile-related wastes have migrated to the housing property along the sewer line.

This recommendation assumes that this property will most likely continue to be used for residential housing.

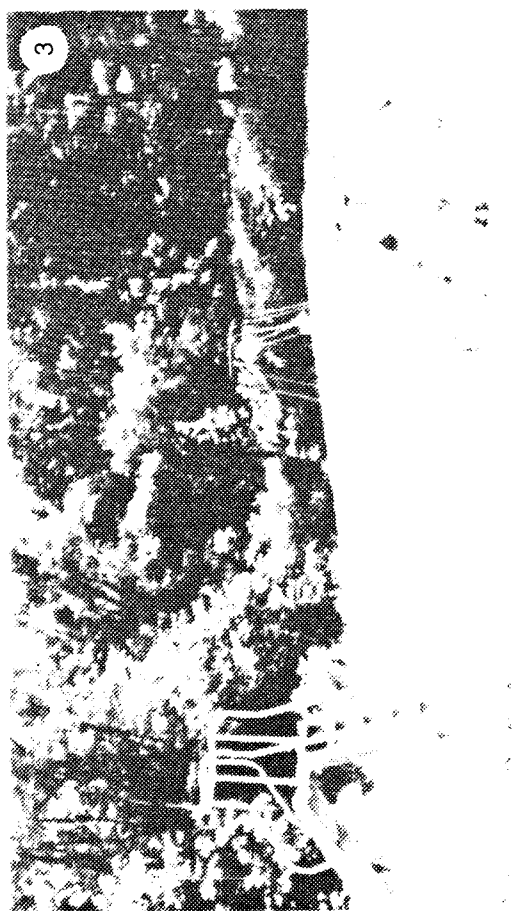
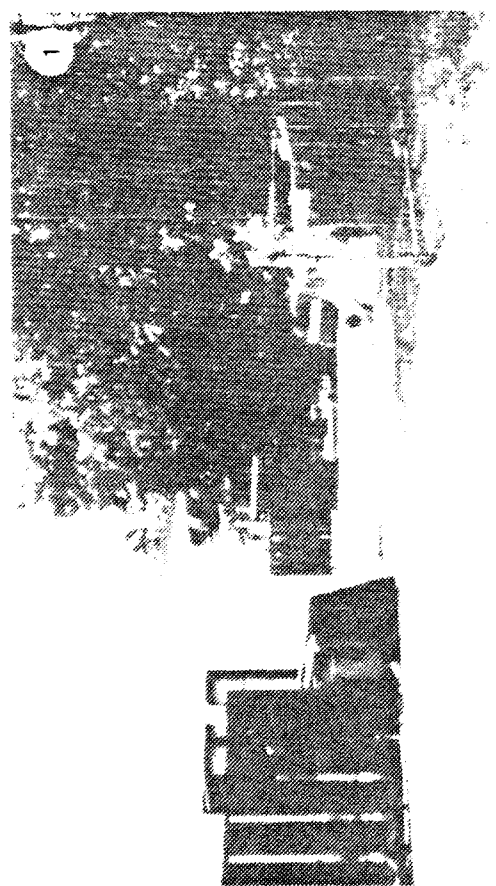
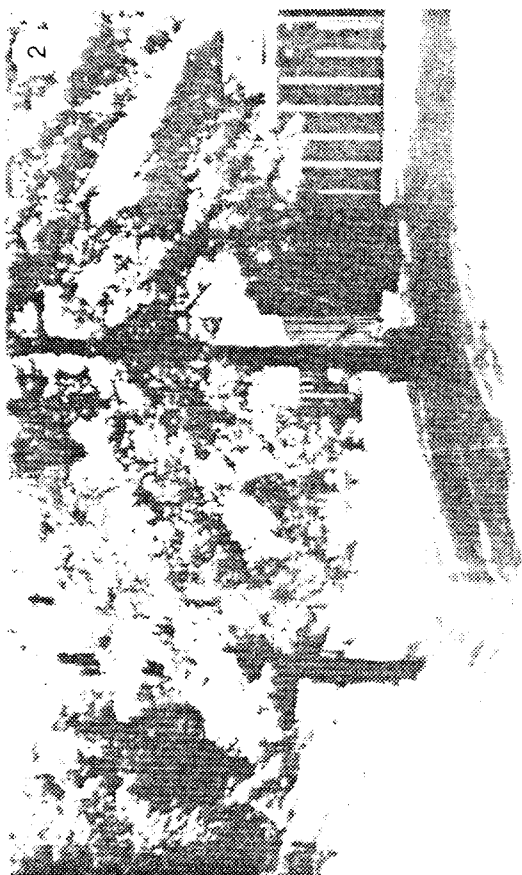
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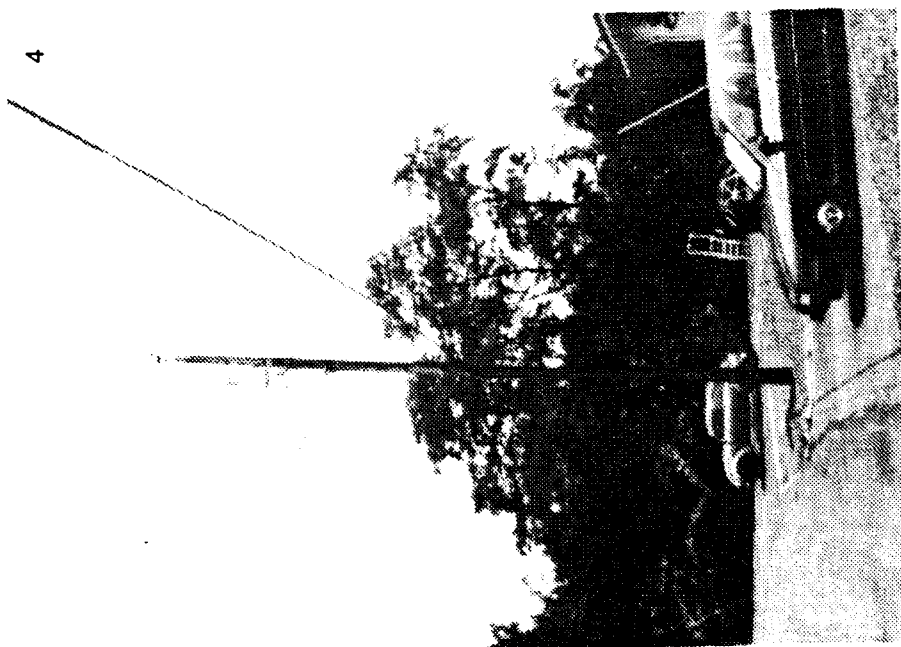
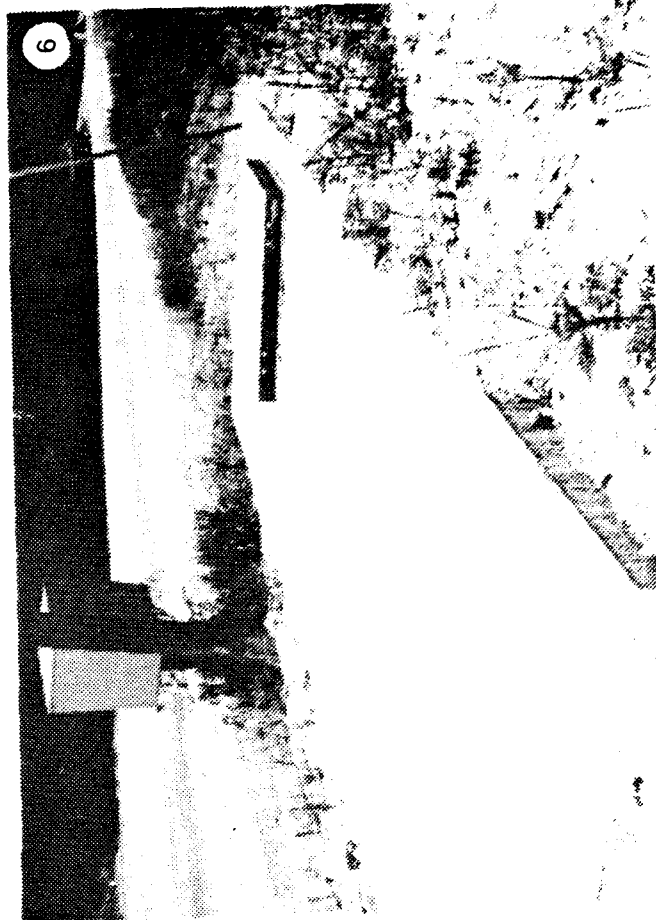
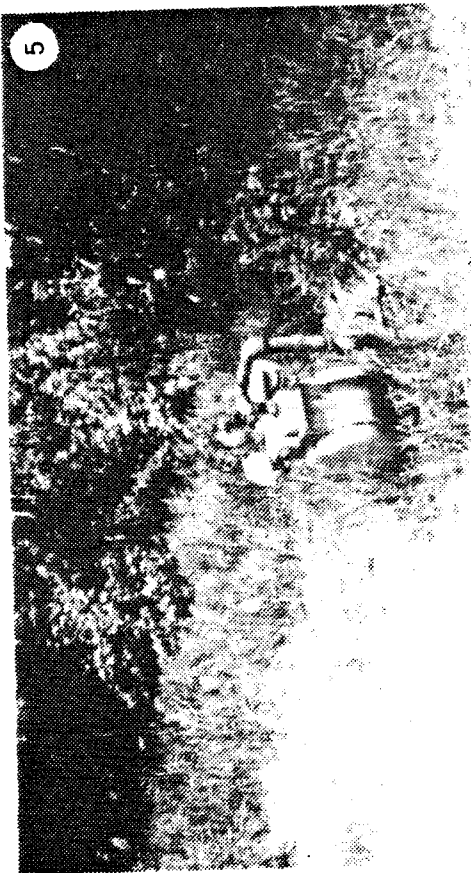
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**APPENDIX:**  
**PHOTOGRAPHS OF ELIZABETH HOUSING FACILITY**  
**AND SURROUNDING LAND**







**IDENTIFICATIONS OF PHOTOGRAPHS**

1. A view of the rear of the housing units.
2. Another view of the rear of the housing units, showing storm drain running from bottom left of view towards the center.
3. Playground area at the housing area.
4. Electrical transformer at the top of a utility pole; responsibility for the transformer lies with the Western Pennsylvania Power Company.
5. Natural gas meter; there are no fuel-oil storage tanks at the site.
6. Water metering station; water supplied by the Western Pennsylvania Water Company.

